

December 2005 Update

Lowry Landfill Superfund Site Addendum Arapahoe County, Denver (5-Year Review Date: 9/30/02)

Highlights Since the 2002 5-Year Review

- **Zone of containment defined, monitoring plan prepared 2005**
- **Compliance groundwater monitoring plan completed 2005**
- **Pilot study of groundwater extraction 2004**
- **Pilot study of soil vapor extraction completed 2003**
- **Water Treatment Plant (WTP) upgrade 2005**
- **North Trench Extraction System (NTES) completed 2005**
- **Feasibility Study at Former Tire Pile Area (FTPA) submitted 2004**
- **Record of Decision (ROD) amendment completed for FTPA 2005**

Brief Site History: The Lowry site is located in Arapahoe County, by the intersection of Quincy Avenue and Gun Club Road, approximately 15 miles southeast of downtown Denver and two miles east of Aurora. In 1964, the land was deeded to the City and County of Denver and used as a municipal and industrial landfill from 1965 until 1980. During that time, millions of gallons of industrial wastes were dumped into unlined pits. Beginning in the mid-70's the EPA, United States Geological Survey (USGS), Colorado Department of Public Health and Environment (CDPHE) and the City of Denver investigated ground water, surface water, sediment, air quality and soil gas. In 1980, Waste Management was contracted by Denver to operate the landfill and stop accepting industrial waste and only accept municipal refuse. In the 1980s the EPA, CDPHE and the City and County of Denver investigated the nature and extent of groundwater contamination at the site and found that it posed a public health threat. As a result, EPA placed the Lowry Landfill on its National Priorities List (NPL) in 1984.

Cleanup Activities Completed: The following activities were completed since 1994:

- Contaminated groundwater is being contained, collected and pretreated at the site then piped via sewer line to off-site treatment plants.
- Landfill gas is collected and treated using enclosed flare technology.
- Former Tire Pile Area (FTPA) waste-pits remedy to excavate, remove and treat surface, subsurface drums, waste-pit soil, debris, and liquids.

Current Status: A pilot study of soil-vapor extraction began in 2001 on the north and south pits in the FTPA and completed in 2003. In August 2005, EPA changed the remedy for the FTPA waste pits from excavation to extraction of heavily contaminated liquids and capping. A final groundwater monitoring plan was implemented in February 2005. The site has been divided into six Operable Units including shallow and deep groundwater, landfill solids and gas, soils, surface water and sediments. Results of the five-year review show that most components of the remedy are protective of human health and the environment.

Summary of Protectiveness: A protectiveness statement cannot be made until all the remedy components are completed. There is no containment feature to address uncontrolled migration of contaminants in a monitoring well in the northwest area of the site. If this area is not addressed, then the site wide remedy would not be protective, albeit the successful completion of other areas.

Issues Impacting Protectiveness: A few issues that do not immediately impact the protectiveness of the remedy were noted. The following table summarizes the status of the follow-up actions addressing these issues.

**Five-Year Review Update Table
(Review Date: 9/30/02)**

Issues	Recommendations Follow-up Actions	Follow-up Actions (Status/Due Date)	Status of Follow-up Actions 12/05	Responsible Party
1) Containment and capture of all groundwater may not be effective; no ongoing monitoring to demonstrate containment	- Define zone of containment or capture and prepare monitoring plan	9/30/04	Zone of containment defined and a monitoring plan prepared 2/18/05.	Waste Management of Colorado, Inc. (WMC), Chemical Waste Management, Inc. (CWM), City and County of Denver
2) Spacing between some monitoring wells is too large to detect possible exceedances.	- Submit compliance monitoring plan	9/30/04	Compliance monitoring plan completed 2/18/05.	WMC, CWM, City and County of Denver
3) Lignite layer has too few monitoring wells to verify containment	- Submit compliance monitoring plan	9/30/04	Compliance monitoring plan completed 2/18/05.	WMC, CWM, City and County of Denver
4) Unweathered Dawson and Denver formations have too few monitoring wells to verify containment	- Submit compliance monitoring plan	9/9/02	Compliance monitoring plan completed 2/18/05.	WMC, CWM, City and County of Denver

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Issues	Recommendations Follow-up	Follow-up Actions (Status/Due Date)	Status of Follow-up Actions 12/05	Responsible Party
5) Performance Standard exceedances at a monitoring well in the northwest area of the site.	<ul style="list-style-type: none"> - Complete ongoing investigations of nature and extent of contamination -Perform Focused Feasibility Study -EPA issue proposed plan -EPA issue ROD amendment -Perform and document necessary response actions 	<p>6/30/04</p> <p>9/29/04</p>	<p>Investigations of nature and extent of contamination completed 6/30/04</p> <p>Pilot Study of Groundwater Extraction 9/29/04.</p> <p>EPA determined that groundwater extraction is an effective contingency measure 12/4/04.</p> <p>No FS required.</p>	<p>WMC, CWM, City and County of Denver</p> <p>WMC, CWM, City and County of Denver</p> <p>EPA</p>
6) North toe extraction system not operating	<ul style="list-style-type: none"> - Complete WTP upgrade, then NTES as required by ROD 	7/1/04	WTP upgrade complete 4/6/05. NTES operational March, 2005.	WMC, CWM, City and County of Denver
7) Water treatment plant not able to treat 1,4-Dioxane to requirements	<ul style="list-style-type: none"> - Complete approved work, select required treatment plant modifications, implement by modifying WTP as necessary - Operate WTP as required by ROD 	<p>7/1/04</p> <p>7/1/04</p>	<p>Construction complete 4/6/05. Effluent discharge meets all performance standards.</p>	<p>WMC, CWM, City and County of Denver</p> <p>WMC, CWM, City and County of Denver</p>
8) Work at FTPA north and south waste pits is incomplete.	<ul style="list-style-type: none"> - Continue work 	Per approved work plan and schedule	<ul style="list-style-type: none"> -EPA determined an FS is required 11/10/2003. -FS submitted 12/30/2004. -EPA issued proposed plan 5/26/2004. -ROD amendment completed 8/15/2005. 	<ul style="list-style-type: none"> -EPA -WMC, CWM, City and County of Denver -EPA -EPA